

WHAT IS CLAIMED IS:

1. A group robot system comprising a plurality of sensing robots,  
and a control apparatus controlling said sensing robot,  
wherein said control apparatus responds to detection of an object by  
said sensing robot to provide control such that a sensing robot other than  
5 said sensing robot that has detected said object moves outside an area of  
search.

2. The group robot system according to claim 1, wherein  
each of said plurality of sensing robots is equipped with a function  
of a predetermined stage,  
said control apparatus responds to detection of an object by said  
5 sensing robot to provide control such that another sensing robot that is  
equipped with a function of a stage differing from the function of said  
sensing robot conducts further search of said object, and  
to provide control such that a sensing robot other than said sensing  
robot that has detected the object and said sensing robot conducting further  
10 search moves outside the area of search.

3. The group robot system according to claim 2, wherein said  
control apparatus enables the function of a sensing robot equipped with a  
function of a predetermined stage among said plurality of sensing robots,  
and when said sensing robot with the enabled function detects an object,  
5 enables the function of another sensing robot that is equipped with a  
function of a stage differing from the function of said sensing robot to  
provide control such that said another sensing robot with the enabled  
function conducts further search of said object.

4. The group robot system according to claim 2, wherein said  
function of said sensing robot is any of a sensing resolution, a sensor type,  
and a processing method of sensor information.

5. The group robot system according to claim 1, wherein said plurality of sensing robots and said control apparatus conduct communication in a hierarchical manner with said control apparatus as the highest level of hierarchy, and

5        said control apparatus responds to detection of an object by said sensing robot to provide control such that said sensing robot that has detected the object and a sensing robot other than a sensing robot located at a hierarchy between said sensing robot and said control apparatus, and relaying communication when hierarchical communication is conducted  
10        from said sensing robot to said control apparatus moves outside said area of search.

6. The group robot system according to claim 1, wherein said control apparatus includes a pheromone robot controlling travel of said sensing robot,

5        said pheromone robot moving, when said sensing robot detects an object, to a neighborhood of said object.

7. The group robot system according to claim 1, wherein said control apparatus includes a pheromone robot controlling travel of said sensing robot,

5        said pheromone robot being responsive to detection of an object by said sensing robot to provide control such that said other sensing robot differing from said sensing robot that has detected said object moves to a neighborhood of said pheromone robot.

8. The group robot system according to claim 1, wherein said sensing robot is capable of a fluttering flight by a fluttering motion.

9. A group robot system comprising a plurality of sensing robots, and a control apparatus controlling said sensing robot,

      wherein said control apparatus responds to detection of an object by said sensing robot to provide control such that a sensing robot other than

5 said sensing robot that has detected the object moves to an initial position.

10. The group robot system according to claim 9, wherein  
each of said plurality of sensing robots is equipped with a function  
of a predetermined stage,

5 said control apparatus responds to detection of an object by said  
sensing robot to provide control such that another sensing robot that is  
equipped with a function of a stage differing from the function of said  
sensing robot conducts further search of said object, and

10 to provide control such that a sensing robot other than said sensing  
robot that has detected the object and said sensing robot conducting further  
search moves to said initial position.

11. The group robot system according to claim 10, wherein said  
control apparatus enables the function of a sensing robot equipped with a  
function of a predetermined stage among said plurality of sensing robots,  
and when said sensing robot with the enabled function detects an object,  
5 enables the function of another sensing robot that is equipped with a  
function of a stage differing from the function of said sensing robot to  
provide control such that said another sensing robot with the enabled  
function conducts further search of said object.

12. The group robot system according to claim 10, wherein said  
function of a sensing robot is any of a sensing resolution, a sensor type, and  
a processing method of sensor information.

13. The group robot system according to claim 9, wherein  
said plurality of sensing robots and said control apparatus conduct  
communication in a hierarchical manner with said control apparatus as the  
highest level of hierarchy, and  
5 said control apparatus responds to detection of an object by said  
sensing robot to provide control such that said sensing robot that has  
detected the object and a sensing robot other than a sensing robot located at

10 a hierarchy between said sensing robot and said control apparatus, and  
relaying communication when hierarchical communication is conducted  
from said sensing robot to said control apparatus moves to said initial  
position.

14. The group robot system according to claim 9 , wherein said  
control apparatus includes a pheromone robot controlling travel of said  
sensing robot,  
5 said pheromone robot moving, when said sensing robot detects an  
object, to a neighborhood of said object.

15. The group robot system according to claim 9, wherein said  
control apparatus includes a pheromone robot controlling travel of said  
sensing robot,  
5 said pheromone robot being responsive to detection of an object by  
said sensing robot to provide control such that said other sensing robot  
differing from said sensing robot that has detected said object moves to a  
neighborhood of said pheromone robot.

16. The group robot system according to claim 9, wherein said  
sensing robot is capable of a fluttering flight by a fluttering motion

17. A group robot system comprising a plurality of sensing robots  
equipped with a sensor function, and a control apparatus controlling said  
sensing robot,  
5 wherein said control apparatus responds to detection of an object by  
said sensing robot to provide control such that the sensor function of a  
predetermined sensing robot among said plurality of sensing robots is  
enabled, and the sensor function of a sensing robot other than the sensing  
robot with the enabled sensor function is disabled.

18. The group robot system according to claim 17, wherein said  
plurality of sensing robots and said control apparatus conduct

communication in a hierarchical manner with said control apparatus as the highest level of hierarchy.

19. The group robot system according to claim 17, wherein said sensing robot with disabled sensor function relays communication of said sensing robot that has detected the object and said control apparatus when said sensing robot detects the object.

5 20. The group robot system according to claim 19, wherein said sensing robot relaying communication of said sensing robot that has detected the object and said control apparatus is a robot capable of a fluttering flight through a fluttering motion, and hovers when conducting said relay.

21. The group robot system according to claim 19, wherein said control apparatus includes a pheromone robot controlling travel of said sensing robot, and  
5 said sensing robot relaying communication of said sensing robot that has detected the object and said control apparatus relays said communication in an arrangement substantially linearly between said control apparatus and said pheromone robot.

22. The group robot system according to claim 21, wherein a line between said control apparatus and said pheromone robot, of said sensing robot relaying communication of the sensing robot that has detected the object and said control apparatus is in plurality.

23. The group robot system according to claim 22, wherein said plurality of lines of sensing robots relaying communication of said sensing robot that has detected the object and said control apparatus relays, in an arbitrary line, sensing information identical to the sensing information  
5 from said sensing robot that has detected the object to said control apparatus.

24. The group robot system according to claim 22, wherein said plurality of lines of sensing robots relaying communication of said sensing robot that has detected the object and said control apparatus relays, for every line, sensing information of a different type from said sensing robot that has detected the object and equipped with a different sensing function to said control apparatus.

25. The group robot system according to claim 17, wherein said control apparatus includes a pheromone robot controlling travel of said sensing robot,  
said pheromone robot being responsive to detection of an object by said sensing robot to provide control such that said other sensing robot differing from said sensing robot that has detected said object moves to a neighborhood of said pheromone robot.

26. The group robot system according to claim 17, wherein said sensing robot is capable of a fluttering flight by a fluttering motion.

27. A group robot system comprising a plurality of sensing robots equipped with a sensor function, and a control apparatus controlling said sensing robot,  
wherein said control apparatus responds to detection of an object by said sensing robot to provide control such that another sensing robot differing from said sensing robot that has detected the object, and equipped with a sensor function of a resolution higher than the resolution of the sensor function of said sensing robot that has detected the object conducts further search of said object.

28. The group robot system according to claim 27, wherein said control apparatus responds to detection of the object by said sensing robot to provide control such that said another sensing robot differing from said sensing robot that has detected the object moves to a neighborhood of said object.

29. The group robot system according to claim 27, wherein said control apparatus includes a pheromone robot controlling travel of said sensing robot,

5        said pheromone robot being responsive to detection of an object by said sensing robot to provide control such that said another sensing robot differing from said sensing robot that has detected the object moves to a neighborhood of said pheromone robot.

30. The group robot system according to claim 27, wherein said sensing robot is capable of a fluttering flight by a fluttering motion.

31. A group robot system comprising a plurality of sensing robots equipped with a sensor function, and a control apparatus controlling said sensing robot,

5        wherein said control apparatus responds to detection of an object by said sensing robot to provide control such that another sensing robot differing from said sensing robot that has detected the object, and that is equipped with a sensor function of a type different from the type of the sensor function of said sensing robot that has detected the object conducts further search of said object.

32. The group robot system according to claim 31, wherein said control apparatus responds to detection of an object by said sensing robot to provide control such that said another sensing robot differing from said sensing robot that has detected the object moves to a neighborhood of said object.

33. The group robot system according to claim 31, wherein said control apparatus includes a pheromone robot controlling travel of said sensing robot,

5        said pheromone robot being responsive to detection of an object by said sensing robot to provide control such that said another sensing robot

differing from said sensing robot that has detected the object moves to a neighborhood of said pheromone robot.

34. The group robot system according to claim 31, wherein said sensing robot is capable of a fluttering flight by a fluttering motion.

35. A group robot system comprising a plurality of sensing robots equipped with a sensor function, and a control apparatus controlling said sensing robot,

5 wherein said control apparatus responds to detection of an object by said sensing robot to provide control such that another sensing robot differing from said sensing robot that has detected the object, and having a processing method of sensor information differing from the processing method of sensor information of said sensing robot that has detected the object conducts further search of said object.

36. The group robot system according to claim 35, wherein said control apparatus responds to detection of an object by said sensing robot to provide control such that said another sensing robot differing from said sensing robot that has detected the object moves to a neighborhood of said object.

37. The group robot system according to claim 35, wherein said control apparatus includes a pheromone robot controlling travel of said sensing robot,

5 said pheromone robot being responsive to detection of an object by said sensing robot to provide control such that said another sensing robot differing from said sensing robot that has detected the object moves to a neighborhood of said pheromone robot.

38. The group robot system according to claim 35, wherein said sensing robot is capable of a fluttering flight by a fluttering motion.



39. A sensing robot capable of a fluttering flight included in a group robot system comprising a plurality of sensing robots and a control apparatus controlling said sensing robot, and in which said control apparatus responds to detection of an object by said sensing robot to  
5 provide control such that a sensing robot other than said sensing robot that has detected the object moves outside an area of search, wherein the sensing robot in the group robot system is under control of said control apparatus.

40. A sensing robot capable of a fluttering flight included in a group robot system comprising a plurality of sensing robots and a control apparatus controlling said sensing robot, and in which said control apparatus responds to detection of an object by said sensing robot to  
5 provide control such that a sensing robot other than said sensing robot that has detected the object moves to an initial position, wherein the sensing robot in the group robot system is under control of said control apparatus.

41. A sensing robot capable of a fluttering flight included in a group robot system comprising a plurality of sensing robots equipped with a sensor function and a control apparatus controlling said sensing robot, and in which said control apparatus responds to detection of an object by said  
5 sensing robot to provide control such that the sensor function of a predetermined sensing robot among said plurality of sensing robots is enabled, and the sensor function of a sensing robot other than the sensing robot with the enabled sensor function is disabled, wherein the sensing robot in the group robot system is under control of said control apparatus.

42. A sensing robot capable of a fluttering flight included in a group robot system comprising a plurality of sensing robots equipped with a sensor function and a control apparatus controlling said sensing robot, and in which said control apparatus responds to detection of an object by said  
5 sensing robot to provide control such that another sensing robot differing from said sensing robot that has detected the object, and equipped with a

sensor function of a resolution higher than the resolution of the sensor function of said sensing robot that has detected the object conducts further search of said object, wherein the sensing robot in the group robot system is under control of said control apparatus.

43. A sensing robot capable of a fluttering flight included in a group robot system comprising a plurality of sensing robots equipped with a sensor function and a control apparatus controlling said sensing robot, and in which said control apparatus responds to detection of an object by said sensing robot to provide control such that another sensing robot differing from said sensing robot that has detected the object, and that is equipped with a sensor function of a type different from the type of the sensor function of said sensing robot that has detected the object conducts further search of said object, wherein the sensing robot in the group robot system is under control of said control apparatus.

44. A sensing robot capable of a fluttering flight included in a group robot system comprising a plurality of sensing robots equipped with a sensor function and a control apparatus controlling said sensing robot, and in which said control apparatus responds to detection of an object by said sensing robot to provide control such that another sensing robot differing from said sensing robot that has detected the object, and having a processing method of sensor information differing from the processing method of sensor information of said sensing robot that has detected the object conducts further search of the object, wherein the sensing robot in the group robot system is under control of said control apparatus.

45. A base station included in a group robot system comprising a plurality of sensing robots and a control apparatus controlling said sensing robot, and in which said control apparatus responds to detection of an object by said sensing robot to provide control such that a sensing robot other than said sensing robot that has detected the object moves outside an area of search, wherein said base station corresponds to said control

apparatus, and controls said sensing robot capable of a fluttering flight through a fluttering motion.

46. A base station included in a group robot system comprising a plurality of sensing robots and a control apparatus controlling said sensing robot, and in which said control apparatus responds to detection of an object by said sensing robot to provide control such that a sensing robot  
5 other than said sensing robot that has detected the object moves to an initial position, wherein said base station corresponds to said control apparatus, and controls said sensing robot capable of a fluttering flight through a fluttering motion.

47. A base station included in a group robot system comprising a plurality of sensing robots equipped with a sensor function and a control apparatus controlling said sensing robot, and in which said control apparatus responds to detection of an object by said sensing robot to  
5 provide control such that the sensor function of a predetermined sensing robot among said plurality of sensing robots is enabled, and the sensor function of a sensing robot other than the sensing robot with the enabled sensor function is disabled, wherein said base station corresponds to said control apparatus, and controls said sensing robot capable of a fluttering  
10 flight through a fluttering motion.

48. A base station included in a group robot system comprising a plurality of sensing robots equipped with a sensor function and a control apparatus controlling said sensing robot, and in which said control apparatus responds to detection of an object by said sensing robot to  
5 provide control such that another sensing robot differing from said sensing robot that has detected the object, and equipped with a sensor function of a resolution higher than the resolution of the sensor function of said sensing robot that has detected the object conducts further search of said object, wherein said base station corresponds to said control apparatus, and  
10 controls said sensing robot capable of a fluttering flight through a fluttering

motion.

49. A base station included in a group robot system comprising a plurality of sensing robots equipped with a sensor function and a control apparatus controlling said sensing robot, and in which said control apparatus responds to detection of an object by said sensing robot to  
5 provide control such that another sensing robot differing from said sensing robot that has detected the object, and that is equipped with a sensor function of a type different from the type of the sensor function of said sensing robot that has detected the object conducts further search of said object, wherein said base station corresponds to said control apparatus, and  
10 controls said sensing robot capable of a fluttering flight through a fluttering motion.

50. A base station included in a group robot system comprising a plurality of sensing robots equipped with a sensor function and a control apparatus controlling said sensing robot, and in which said control apparatus responds to detection of an object by said sensing robot to  
5 provide control such that another sensing robot differing from said sensing robot that has detected the object, and having a processing method of sensor information differing from the processing method of sensor information of said sensing robot that has detected the object conducts further search of said object, wherein said base station corresponds to said  
10 control apparatus, and controls said sensing robot capable of a fluttering flight through a fluttering motion.

51. A pheromone robot included in a group robot system comprising a plurality of sensing robots and a control apparatus controlling said sensing robot, and in which said control apparatus responds to detection of an object by said sensing robot to provide control such that a  
5 sensing robot other than said sensing robot that has detected the object moves outside an area of search, wherein said pheromone robot controls travel of said sensing robot capable of a fluttering flight through a

fluttering motion.

52. A pheromone robot included in a group robot system comprising a plurality of sensing robots and a control apparatus controlling said sensing robot, and in which said control apparatus responds to detection of an object by said sensing robot to provide control such that a  
5 sensing robot other than said sensing robot that has detected the object moves to an initial position, wherein said pheromone robot controls travel of said sensing robot capable of a fluttering flight through a fluttering motion.

53. A pheromone robot included in a group robot system comprising a plurality of sensing robots equipped with a sensor function and a control apparatus controlling said sensing robot, and in which said control apparatus responds to detection of an object by said sensing robot to  
5 provide control such that the sensor function of a predetermined sensing robot among said plurality of sensing robots is enabled, and the sensor function of a sensing robot other than the sensing robot with the enabled sensor function is disabled, wherein said pheromone robot controls travel of said sensing robot capable of a fluttering flight through a fluttering motion.

54. A pheromone robot included in a group robot system comprising a plurality of sensing robots equipped with a sensor function and a control apparatus controlling said sensing robot, and in which said control apparatus responds to detection of an object by said sensing robot to  
5 provide control such that another sensing robot differing from said sensing robot that has detected the object, and equipped with a sensor function of a resolution higher than the resolution of said sensor function of said sensing robot that has detected the object conducts further search of said object,  
10 wherein said pheromone robot controls travel of said sensing robot capable of a fluttering flight through a fluttering motion.

55. A pheromone robot included in a group robot system

comprising a plurality of sensing robots equipped with a sensor function and a control apparatus controlling said sensing robot, and in which said control apparatus responds to detection of an object by said sensing robot to  
5 provide control such that another sensing robot differing from said sensing robot that has detected the object, and that is equipped with a sensor function of a type different from the type of the sensor function of said sensing robot that has detected the object conducts further search of said object, wherein said pheromone robot controls travel of said sensing robot  
10 capable of a fluttering flight through a fluttering motion.

56. A pheromone robot included in a group robot system comprising a plurality of sensing robots equipped with a sensor function and a control apparatus controlling said sensing robot, and in which said control apparatus responds to detection of an object by said sensing robot to  
5 provide control such that another sensing robot differing from said sensing robot that has detected the object, and having a processing method of sensor information differing from the processing method of sensor information of said sensing robot that has detected the object conducts further search of said object, wherein said pheromone robot controls travel  
10 of said sensing robot capable of a fluttering flight through a fluttering motion.